The Air Line Pilot

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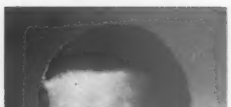

I'll Take Guarantees

An Insurance Writer Takes Exception to "What Price Protection?" Here's His Answer—Another Side of a Vital Subject

By Robert W. Osler

A copy of the July issue of *The Air Line Pilot* came into my hands. I read Capt. G. C. Kehmeier's article, "What Price Protection?". I couldn't help but take exception to many of his statements because just the night before, in preparation for writing an anniversary article for the November issue of one of our magazines, I had been reading the 1878 issues. In them was mention of almost all of the arguments Capt. Kehmeier advances.

I reached over on the bookshelf and picked up *The Truth About Life Insurance,* by Paul Speicher, late president of The Insurance Research & Review Service. It came off the press 17 years ago. The arguments were answered there.

I renewed my acquaintance with *Life Insurance Speaks for Itself,* by M. Albert Linton, former president of the Actuarial Society of America, published in 1937. The arguments are all answered there—with actuarial computations to back them up.

Arguments on the subject of Renewable Term in particular also seem adequately answered by the history of the Provident Savings Society, formed by Sheppard Homans to write Renewable Term on an "invest the difference" plan. The company went g-bust and had to be reinsured. It went g-bust because of an inherent weakness in Renewable Term we'll point out in a minute.

If you think that's going pretty far back in history to prove a point, let me call attention to Capt. Kehmeier's statement, "Originally, only Term insurance was sold."

That's quite true—but the statement takes us back even further into history than I go above. It takes us back to June, 1536, the date of the first recorded life insurance policy. That policy was one year Term. (Whether it was renewable or not I can't say because the insured died within the year.)

From 1536 to 1762, Term *was* about the only thing sold. Then in 1762, the Equitable Assurance of England went on the market with a whole life policy.

The significant point of this touch of ancient history is that for the first 146 years of its history, about all life insurance offered was Term insurance, and virtually anybody could get it. Medical examinations were non-existent.

But even though Term was about the only thing offered and anybody could get it, practically nobody bought it! It wasn't until Equitable put a whole life policy on the market that life insurance began to attract the public.

Even more significant is the fact that not one company survives from the "Term only" era of life insurance, whereas the first company to issue a true whole life policy, Equitable of England, is still alive and going strong!

No "Conspiracy"

There is no "conspiracy of silence" to hide Term insurance. Not many companies write yearly Renewable Term on an individual basis simply because *not many individual buyers want it,* and history proves the fact.

The charge that the companies don't want to sell this form of insurance is ridiculous when you realize they actively and hotly solicit Group insurance and issue upwards of $7,000,000,000 of it a year—99 per cent of it in the form of yearly Renewable Term!

One point I would like to clear up is Captain Kehmeier's objections to the inadequacy of mortality tables as they have been used. No actuary would contend that because a mortality table does not reflect mortality rates as of the instant it is in use, policyholders are being overcharged. He wouldn't make such a statement because it is no more mathematically true than that two and two are six.

Let's assume that the use of the American Experience table up to about 1947 (the change-over to C. S. O. varied in various jurisdictions) was charging policyholders too much. In that case, a switch to the C. S. O. table, decidedly more modern, even if not up to today's exact mortality, should have resulted in a big drop in premiums, shouldn't it?

Let's take the rates for a couple of

Vol. 22, No. 9

The Air Line Pilot

September 1953

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Published Monthly by The Air Line Pilots Association, International, Affiliated with A. F. of L. Publication offices: 55th Street and Cicero Avenue, Chicago 38, Illinois.

Advertising appearing in this magazine cannot be construed as being an endorsement by The Air Line Pilots Association or the Air Line Pilots.

Annual Subscription, $2.50

Ed Modes, Editor

illustrative policies the year before and the year after the change-over.

Age of Issue	Company A Par. Gross Rate Ordinary Life Rate using—		Company B Non-par, Net Rate Ordinary Life Rate using—	
	A.E.	C.S.O.	A.E.	C.S.O.
10	$15.94	$15.87	$11.63	$11.77
20	19.21	19.68	14.29	14.79
30	25.42	25.42	18.75	19.20
40	33.01	34.45	25.85	26.65
50	48.48	49.33	38.84	39.75
60	77.69	75.19	62.51	62.82

Big drop, huh?

"Oh, now," you say, "of course what happened was that coincidentally with switching tables, these companies reduced their interest assumptions on the reserve."

That's true. Both dropped their assumptions ½ per cent when they switched to C. S. O. *But that's part of the story!*

Basis of Premium Rates

A premium rate isn't made up of just the mortality factor. It is a combination of (a) tabular mortality; (b) interest assumption; (c) loading for cost of operation; *and* (d) competition.

Mathematically, you know how much you have to collect from any policyholder at any age on any one of the policy forms you issue in order to set up the required reserves and contingency surpluses and to run the business. You know to start that you've got to keep the rate at the lowest possible amount because you have 703 other legal reserve life insurance companies throughout the country yapping at your heels trying to get the same business you are. (It is this competitive situation that has led all legislation and regulation, not to concentrate on keeping life insurance companies from overcharging, *but to keep them from undercharging and imparing security.*)

You know mathematically what amount of money you have to get in. That's the only concern—the total amount, not the sources. So if you know from company experience you will make a 20 per cent gain on tabular mortality, then you simply put in less loading for the operation expense factor. If you are guaranteeing more interest than you can earn, then you make it up out of mortality gain or loading. In the end, the rate will be the same whether based on C. S. O., American Experience, or mortality at the battle of Hastings.

The rate will be virtually the same regardless of table used because always, by taking the mortality gain into account in determining the amount of loading for expenses, you are actually writing rates on the basis of *current* mortality experience.

Why Change Tables?

If it makes no difference what table is used, then why did companies change to C. S. O.?

They changed because the National Association of Insurance Commissioners finally decided that whether it made any difference or not, constant criticism was bad public relations, and they appointed a committee to compile a new table and recommend certain other changes in valuation laws.

The change cost untold millions—cost of compiling the table, which, even with today's electronic computers, takes months and even years; cost of each individual company compiling new rates, printing new rate books and policies, and the time spent in getting state legislatures to pass laws permitting the use of the new table. (That last one was tough. Gov. Dewey even vetoed the bill once in New York!)

So millions were spent, and who paid it? You, as policyholders, because no company has any money save what it gets in premiums and what it earns on policyholders' funds on deposit, which earnings are eventually credited back to policyholders themselves if not spent on unnecessary work.

Millions were spent; you paid the bill; and what for?

For what was mathematically demonstrable all the time: *just about the same rates.*

Under public pressure the industry can compile a new table and spend the millions of your money the change takes, again. Then that table will be out of date—because you have to compile any mortality table on the basis of *past* experience, and it's out of date, actually, from the day it's put in use.

About Borrowing

What about this old theory that the company makes you pay interest on your own money when you borrow it?

Life insurance is a mathematical science. It is based on that branch of higher mathematics known as the *Theory of Probabilities.* One of the reasons such criticisms persist is that refuting them gets into a branch of mathematics that few people but actuaries have ever studied.

That's what you are up against when you try to answer the charge, "You have to pay interest on your own money."

The policyholder reserve, which is the place the money comes from when you borrow on a policy, is a fund which, together with interest to be earned and premiums to be paid, will exactly equal the policy-contract obligations of the company as they fall due.

It is common to refer to "the reserve on a policy." Actuarily there is no such a thing. There is *a* reserve, covering all policies issued by the company.

Therefore, when you borrow money on your policy, what you are doing is putting up the future value of that policy as collateral for a loan from the fund being held for all policyholders and to which you have no claim until your policy matures.

When the company calculated the amount needed in that fund, it assumed that it would earn a total amount of money in interest over the years. Now, you take out part of it. The part you take isn't there to earn interest. So how is the fund going to come out mathematically—unless you replace the interest it can't earn on the money you have taken out in advance of the time the fund was calculated to pay it to you?

Actually, part of the interest you pay is credited right back on the reserve to your benefit. If you pay 5 per cent on money you borrow and the interest assumption on the reserve is 2½ per cent, which is about average today, then half the interest you pay is deposited right back to your future account. The other 2½ per cent goes to cover the cost of

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(From 1952 edition of "Who's Who in the Mid-West")

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handling the loan—which is almost always what is technically known as a "small loan," expensive to handle.

Another thing, when you die you *don't* forfeit the reserve.

How can you "forfeit" the reserve? *They paid it to your beneficiary!*

Let's fall back into the technically incorrect concept of an individual policy reserve to try to clarify the matter.

How Insurance Works

If you've got enough money to pay your family the amount of income you want them to have if anything happens to you (or enough money to do whatever you bought the life insurance to do), then you don't have to have life insurance and it's uneconomical to buy it because it costs money.

You don't have to buy life insurance if you have the money elsewhere. So what does the so-called "investment-type policy" do? It builds up a cash value for you with tax-free compound interest accumulations so you *will* have the money aside from expensive life insurance. Each year it insures you for just the difference between the money you already have accumulated (and so don't need to buy insurance for) and the amount you said you wanted but haven't yet accumulated.

Any time you die, it pays you what you've accumulated, plus the amount of insurance you had, which is always and exactly the difference between what you were going to accumulate if you lived long enough and the amount you have saved to date.

In other words, you say to the company, "When I die, my family is going to need the income from 100,000 bucks to keep going. If I live long enough, I'll accumulate the $100,000 in cash and compound interest. But without insurance, if I die, my family will get back only what I've saved to date, which might be 'way short of the $100,000."

So the company says, "Okay. We'll draw up a contract with you, a unilateral contract—that is, one which you can go back on, but we can't. Each year, you deposit a certain amount with us. We'll put enough of this into a reserve so that your deposits each year, plus compound interest, will total the $100,000 whenever you say—10 years, 20 years, age 65, age 100 . . . you choose. The rest of the money we'll use to buy life insurance on you in the exact amount of the difference each year between the amount you have saved that year and don't need insurance for, and the total you want. If you die, we pay your widow the $100,000 you had planned to save. It'll be made up of what you had saved plus insurance for the difference."

Signed articles appearing in THE AIR LINE PILOT do not necessarily represent the views of ALPA. Nor do they reflect Association policy, except when specifically stated. Such articles, often of a controversial nature, are published in line with THE AIR LINE PILOT'S policy of promoting discussion and stimulating free exchange of opinion.

—The Editors

See? How can the reserve be "forfeited" when they paid it to you?

The Reserve-type Policy

The economical way to buy life insurance is to buy only enough to make up the difference between what you already have and what you expect to accumulate. Practically speaking, if you buy more than that, you are paying for insurance you don't have to have.

The type policy which has a reserve does this job for you automatically. You are never paying for one cent's more insurance than you think you need. Each year you pay for only the amount you haven't yet accumulated—down to the sixth decimal place.

Now, roughly speaking, you can do the same thing by buying Renewable Term and "investing the difference." But here we run into difficulties.

You say, "Okay. Since in actual effect, the reserve-type policy is buying Term and investing the difference, I'd rather do it that way. Maybe I can earn more than the 2½ per cent the company guarantees on my accumulations."

Maybe you can. It's easy—on paper. (Of course on paper, people usually forget about fluctuations in value, income taxes on the interest accumulations, brokerage fees, and all those minor matters.)

So you are going to buy Term and invest the difference? (We'll ignore the question of *where* are you going to invest it and what has happened to yesterday's blue-chips.)

Some Important Questions

Are you going to buy Term for the full amount of the accumulation you hope to have, and renew it until you have the full amount?

If so, you are going to be buying more insurance each year than you need, because each year your capital accumulation grows (presumably), and you need decreasingly less than the full amount of insurance.

Are you going to drop a certain amount of your Term each year so that at all times you have only an amount equal to the difference between your accumulation and what you hope to have?

That's going to be a little tough—tough to do as efficiently as the reserve-type policy does it automatically. You'll have to get the company to issue your $100,000 (if that's the sum) in $1 policies—and they're going to kick like a steer at that.

So if you try to do the yearly reducing yourself, you are doing it inefficiently compared with the way the company does it all in one policy—and inefficiency costs money.

And, say, by the way. If you follow this plan of buying yearly decreasing amounts of Term, then your accumulation fund corresponds exactly to the reserve on a life insurance policy, doesn't it? You could call it your personal "reserve."

Now, if you die, that personal reserve you accumulated up to that time plus the difference in Term insurance will be paid your wife, won't it? Will you then speak of "forfeiting" your reserve when you died? If not, then why do you say it when exactly the same thing happens under a life insurance policy?

You know, if this reserve-type insurance is *really* such a racket, insurance company executives in on the "know" must be buying it by the fistful, mustn't they?

Don't bet on it! They prefer the guarantees of reserve-type policy contracts to the beautiful assumptions of "invest the difference" illustrations!

One last point in talking about costs in life insurance!

Term vs. Permanent

Yearly Renewable Term (or any kind of Renewable Term) is expensive insurance because it shows a greater mortality rate than permanent insurance. The reason is what is known as "anti-selection"—the little g i m m i c k that broke Homan's Provident Savings Society. More people whose health is bad at renewal time will keep their policies than will people whose health is good.

Thus good risks drop out and poor risks stay in, and that ups mortality, and companies know it is going to happen in advance; so they load the cost of Renewable Term to take care of it.

The proof is right there in the Fig. 4 illustration accompanying "What Price Protection."

The cost for pure insurance under the Renewable Term plan illustrated was $3,404.50. The cost of the pure insurance provided by the Ordinary

Life policy—the cost of the insurance only, taking out the reserve accumulation—was $1,418, a little more than half as much.

Part of that lowered cost was a result of the fact that interest on reserve funds under the Ordinary policy paid some of the premiums. And isn't that okay? Itsn't it better to pay premiums out of interest than out of pocket? But part of the difference in cost is the higher mortality rate on Renewable Term—which means that you are always paying more for your pure insurance than you would have to under a reserve-type contract.

That illustration, it was pointed out, fails to take into account the interest the Term buyer was earning on the money he didn't put into the reserve on a policy.

Well and good, but what interest was he going to earn? What guarantees that he will earn it? You can only "assume." When you use a reserve-type policy, you don't have to *assume* and you don't have to ask. The rate of interest is stated and guaranteed right in the contract.

For my part, I am a conservative soul—especially where my family's bread and butter, or the bread and butter of the old man I will someday be, is concerned. For those two things, I want *guarantees,* not *assumptions.*

Two Views

I'll close with one quotation from Linton's book—mentioned at the beginning of this article:

"If you want a tough assignment, try arguing with policyholders who have paid renewable term premiums for 20 or 30 years. Tell them about the working of compound interest over long periods. Tell them about the high expense and abnormal mortality characteristics of renewable term insurance.

"When you have finished explaining, they will tell you that the company knew at the outset that the premiums would reach unreasonable levels and it never should have permitted them to embark upon such a program in the first place.

"Those whose families have benefited in actual cash are dead. The survivors feel that they have paid an exorbitant amount for protection they have not used and now have nothing left to show for their money. Furthermore, they resent intensely the high rate of premiums at advanced ages. They are dominated by a natural human reaction, and reasoned argument will have but little weight, as it will come too late for the basic error to be remedied.

"If only those who led people into this error would stay around to help convince the irate policyholders that they had not been swindled! But they will not be on hand. They will have disappeared from the scene, and company representatives will have the pleasant task of trying to stay the policyholder's anger!"

I said that would be the end, but I can't refrain from one more quotation, this being from a leaflet on Government War Risk Insurance, issued by the Veterans' Administration:

"It is unwise for men to take out renewable term insurance as a permanent thing. It would be wrong for the United States to tempt people into keeping up the kind of insurance which would be impossible for them to carry when they reach old age and, therefor, would be nothing but a snare to them."

About Pilot Error: An Open Letter

(EDITOR'S NOTE: The following letter, written by C. N. Sayen, was in answer to an article which conveyed a blanket indictment of "pilot error" as the cause of most air crashes. The letter was printed in the Chicago Daily News of July 30, 1953, and is reprinted here because of the widespread comments of approval which it received.)

The article appearing in the July 23 Daily News entitled *"Man's Errors Cause Most Air Crashes"* and written by Paul R. Leach of your Washington Bureau is such surface reporting that it raises grave questions as to the research and knowledge that goes into the remainder of the reporting of your newspaper.

Mr. Leach accepts the phrases "pilot error" at face value without any research or analysis to determine what researchers mean by pilot error. He leaves the total impression that inadequate or careless pilots are killing people by the droves.

Did you ever hear of a pilot who deliberately made an error that resulted in his own destruction? If an accident is attributed to pilot error, the question to any sensible researcher is—what caused the error?

Was it faulty design of the aircraft? Was it an inadequate pilot training program? Was it a combination of errors of other individuals that put a pilot in a spot from which he could not escape? And, if one of the foregoing is true, was it pilot error?

The Air Line Pilots Association, International, a professional organization of practically all of the air line pilots flying for U. S. carriers, independently investigates every major air carrier accident.

The pilots readily admit that there is occasionally an accident caused by pilot error. However, if we were to stop our research at that point, little would be accomplished in increasing air safety. The question is to find the cause behind the combination of circumstances that led to the accident.

Accidents usually start hundreds of miles from the scene of the accident. Maybe the cause was in the design of the aircraft or the design of one of its components or the design of the ground facilities that the pilot must use to guide his aircraft. If any one, or combination, of the foregoing, coupled with an unusual flight condition, result in an accident, is it pilot error?

Unfortunately, "pilot error" is often a convenient catch-all by which to explain away other people's mistakes or inadequacies of research. The pilot is the man out front responsible for the operation of the aircraft. If something happens to the aircraft, he is the one likely to be blamed. He has to make the split second decisions, utilizing the materials and information furnished him by others.

However, if the aircraft, components, materials and information put together by others under the convenience of sufficient time to do research and Monday morning quarter-backing builds a situation which permits an error to occur, do we have pilot error?

We readily admit that pilots, like all humans, can make errors. We deny that any of these errors are ever made deliberately.

The Pilots and Legislation

ALPA's Legislative Representative Monitors the Political Skies and Reports No Turbulence in D.C.'s Wild Blue Yonder

By Larry Cates

The constitution and by-laws of the Air Line Pilots Association has, from its inception, contained a section which sets forth that it shall be an object of the Association . . . "to urge, support, and sponsor the passage of legislation and regulations affecting air line pilots which will improve, protect and increase the safety of their working conditions."

It is from this viewpoint that ALPA monitors all legislation, regulations, appropriations and reorganization plans which originate in the various Governmental branches in Washington. It was with this in mind that ALPA, a leading proponent of periodic overhaul, greeted the incoming Administration last January on its entry into Washington. Here was the first opportunity after 23 years of operation under the Civil Aeronautics Act to call the legislative and regulatory paper-pyramid into the shop for overhaul, as called for in the platform of the incoming disciples of new political and economic philosophies.

Prior to the change in the Administration, various segments of the civil aviation industry had surveyed the results of the last Presidential election and "viewed with alarm" the extent of the major surgery likely to be administered to this, the youngest industry of "public convenience and necessity and the National Defense." Apprehensions were based on the fact that civil aviation in the United States was brought to life and nurtured to its present state under the leadership (and/or domination) of one political party which employed a mid-wife of subsidy and clothed the infant in hand-me-down technical developments from previous World Wars.

A Look at the Record

The 83rd Congress, first session, under the new Administration, has come and gone. As Al Smith, the "Old Warrior," used to say, "Let's take a look at the record." That's always good advice. We in Washington are constantly reminded of that advice by words carved in stone over the door of one of the marble edifices in Washington . . . *"The Past Is Prologue."*

NEGOTIATIONS: Pilot and company representatives are pictured here as negotiations on NWA were concluded with the signing of an agreement recently. The NWA agreement is one of a total of 197 of various types negotiated and signed by ALPA during the past two years.

But . . . in this case, search as one might, there is no record of civil aviation policy change in the legislative history of this Congress. True, there are some minor items in the usual appropriation bills. Our search was not so much to find a record; we had hoped to find an indication of future policy. It is true that there was some surgery of the plastic type applied to the aviation appropriation bills which resulted in what promises to be a mild and general reduction in funds available and has brought about the expected shuffling of agency field offices and personnel, from here to there, with possible effect undetermined.

It may be of interest to note here that the 83rd Congress, first session, spent a total of 227,917.55 man hours in session, exclusive of committee work, junkets and investigations. To record these sessions, a total of 16,708 pages of Congressional Record were needed. In perusing through those pages it will be found that certificated civil aviation is mentioned about as often as references would be made to the antics of a wayward daughter when a country preacher drops in for dinner.

National Defense Aspects

In reply to concern expressed by ALPA over this small degree of attention directed at civil aviation, the present Administration makes a point of its "make haste slowly" policy, and indicates that the promised overhaul is at a stage where everything is disassembled and laid out on the bench for inspection, replacement, beefing up, substitution and reassembly preparatory to operations.

It is hoped that political party criticism is not interpreted by those who may read these lines. The degree of concern expressed is indicative of ALPA's increased responsibility in the present phase of civil aviation and the industry's increasingly important relation to the National Defense. It is evident that within a few short years commercial competition and military requirements will force a complete overhauling of present systems of traffic, communications, airport standards and

the entire "firstest with the mostest" transportation policies.

Operational and design decisions must be made now and legislation and regulations entered into the books in anticipation of the renaissance of aviation, as we now know it. Jets, turbo props, transports, helicopters, guided missiles, rockets, space stations and perhaps, even a plane designed for local service carrier operation, are more than just a figment of imagination and doodling.

If it is true that the *"Past Is Prologue,"* the first six months of the new Administration has indicated a strong desire to get the Government out of business . . . labeled by some, a give-away program. This policy has already been applied in a degree to the certificated civil aviation industry by a reorganization plan which transferred the air mail subsidy from the Post Office Department to the CAB. This Board now becomes the sole responsibility for civil aviation promotion and development, and will determine and dispense Federal funds necessary for that purpose. Under this arrangement, the Post Office will show a profit estimated at ¾ cent on each letter, and 25 cents on each parcel post package. The present effect of this change on the civil aviation industry is not apparent at this time. There are, however, certain qualms arising over the future of local service carriers, who now receive the major portion of the aviation funds labeled as subsidy.

The Local Service Program

ALPA is anxious to support the local service program and argues that it is one of the most important potentials in the National Defense. It is well known that most of the four-engine equipment is ear-marked for National Defense work in the event of an emergency. It is also well known that the sub-contracting principle of American industry is the key to mass production so necessary to the "get there firstest with the mostest" policy. With four-engine equipment off to war or to an emergency, only local service carriers will remain to tie together the sub-contracting supply and assembly lines.

(As President Sayen has pointed out in a number of conferences in Washington, the subsidy now directed to the local service carrier is truthfully a subsidy benefit for the communities served rather than the carrier.)

An additional possible policy of the Administration might be indicated in the discussions now directed at possible user charges for services now provided by the Government to aviation, such as traffic control, communications, weather service, markers, beacons and a host of design and research activities.

POLICY: The Executive Committee meets at the Home Office on August 5, 6 and 7. Front row (l. to r.) F. A. Spencer, AA, Secretary; C. N. Sayen, President; J. E. Wood, EAL, First Vice President; Lyle R. Hincks, TWA, Treasurer. Second Row (l. to r.) Regional Vice-Presidents M. E. Swanson, NWA, Region III; C. A. Peternell, UAL, Region V; J. P. Talton, EAL, alternate for W. T. Babbitt, Region II; L. R. Williams, AA, Region IV; William M. Masland, PAA, Region I.

Changes Anticipated

Most certainly there will be major changes made in civil aviation policy under the present Administration. In consolation, it is well to note that the accumulation of years of spearheading for air line safety has brought about an appreciation and acceptance of the majority opinion of the Air Line Pilots Association. The prestige of ALPA has been tremendously increased with the gradual acceptance of the importance of in-service testing to air safety. Economic arguments have not stood up in the face of crash statistics, regardless of evasive pilot error findings. Agencies and committees in Washington readily admit the need for operational approach and know-how in the solutions to the problems of the industry. The present machinery of ALPA, especially the Annual Air Safety Forum approach, will play an important part in the aviation renaissance. (That near-miss that all pilots are familiar with may be an important part in the jig saw puzzle. ALPA would like to know about it to further advance the solutions needed in air safety.)

Pilot security, which has an important bearing on maintaining a strong air line industry and National Defense reserve, has received recognition. Through ALPA's efforts, protective provisions and job security in air line mergers have been increased during the last year. The precedents established are outstanding in labor history.

In all fairness it must be admitted that the problems of a new approach to civil aviation policy are not unknown to the new Administration. Other problems, some inherited, and some gift-wrapped in Russia, have had to be met first. Nor is there lack of flexibility in the new policy chiefs to meet the constantly changing demands of the industry. Witness the authorized expenditure of 1.3 billion dollars contrary to campaign statements of economy and in excess of the amount authorized by the last Congress.

ALPA Position Sound

What then may we expect when civil aviation comes to the top of the stack in the "make haste slowly" program? Most assuredly the government-out-of-business approach (and the air lines hit the big business billion dollar mark in receipts last year) will prevail. User charges will enter the picture. No matter what develops, ALPA is in a sound position. The operational approach or the in-service pay-off test has survived and grown stronger regardless of politics, fluctuating national economy and national emergencies. Could it be otherwise when the responsibility of the pilot to his passengers and his family remain the same?

Every pilot, so long as he flies, is of necessity a lobbyist for safety and, contrary to earlier claims, he is also a business man. He is one of the main cogs in an annual billion dollar income. Together, the combination fits the occasion. We may look ahead with confidence.

Operation Volcano

Did you ever try to take off on a runway covered with what resembles a half inch of powdered cement?

A Volcano Blows Its Top . . . and Pilots and Air Lines Find a Whole New Set of Operational Problems Tossed in Their Laps.

By Capt. Robert W. Stevens

Aside from weather, it's pretty unusual circumstances that will completely stall all scheduled air line operations and paralyze an airport. Like the time a few years back when TWA found itself operating right into the core of a shooting war in Palestine.

In my book, July 9, 1953, at Anchorage, Alaska, deserves a special notation in the realm of rarity: We were grounded by a volcano. As far as can be determined, it was probably the first time in the history of commercial aviation.

The culprit was Mt. Spurr, 76 statute miles to the west of Anchorage. Seventy-six miles distance would seem to put plenty of protective open space in between. But when you put planes and volcanic ash into the air at the same time, you've got operational problems of staggering proportions.

Anchorage is a busy air cross-roads, serving an area where air transport predominates. July 9 got underway just about as usual, the air terminals on the city's outskirts operating normally.

Our first indication of what the day was to bring came at approximately 11:15 AST. A purplish, cone-like cloud, carried by prevailing winds, moved in on the city from the west. Over the city, volcanic ash fell like snow. Visibility worsened until it was necessary to close the airfields.

Two Days Before Air Cleared

We discovered that the phenomena which had had us perplexed was caused by an eruption of Mt. Spurr, usually a well-behaved volcano as volcanos go.

The eruption threw rocks, ashes and smoke to a height of 35,000 feet. While the rock and lava fell near the mountain and did not reach the Anchorage area, the finely pulverized ash drifted with the upper air current in an easterly direction and covered the city. The only other settled area affected was the small native village of Tyonek on the west shore of Cook Inlet.

When the fall of volcanic ash lessened three hours later, visibility remained at one-half mile for several hours. It was two days before the air cleared to what could be considered a VFR haze condition.

How do you operate from an airport covered with what resembles a half-inch of powdered cement? How will your equipment hold up? We didn't know. The only previous similar experience was the Katmai eruption which covered the town of Kodiak beneath 18 inches of volcanic ash in 1912—hardly any help or precedent for solving air age problems. But we found the answer to these and many other questions before we got back into operation.

Of immediate importance, the air lines diverted enroute flights to alternates and hangared what equipment they could. It was initially feared that, in addition to being highly abrasive, the ash would also be exceedingly corrosive. It was for this reason as well as for defense measures that the Air Force immediately moved all its flyable aircraft in the area to other bases. Since other eruptions had occurred in the back country earlier in the summer, government volcanologists were studying the area and some information was available on the effects of the ash. It often contains sulphur monoxide and sulphur dioxide in sufficient quantities to form highly corrosive sulphuric acid when mixed with water.

About the Author

Capt. Robert W. Stevens flies for Pacific Northern Air Lines. He is a member of Council No. 109, Seattle. In recording this unusual occurrence for THE AIR LINE PILOT, he said: "It is felt that what we have learned should be made available for future reference. . . . While this situation may never arise again, it is hoped the experience gained will be of assistance."

Immediate analysis of the ash by Public Health officials found such acidity practically non-existent in this case, eliminating at least one problem.

CAA Issues Bulletin

Advising caution, the CAA said:

"The volcanic dust still present in the air is highly abrasive. Flying operations combined with dusty ground operations are certain to cause increased maintenance cost through engine and airplane parts wear. In addition to the abrasive effects of the volcanic ash it readily absorbs water and will probably result in a marked increase in oil sludge. Blowing dust may penetrate gasoline systems with sufficient volume to combine with water and form a sludge paste which could block off the fuel flow. Oil sump plugs should be removed frequently from airplanes in regular service to check for sludge or compound deposits. Fuel screens should be carefully checked for clogging or build-up of pasty deposits. The abrasive effects of the ash will cause rapid wear of instrument bearings, and air filters used in conjunction with vacuum operated instruments may be expected to clog up to the point of unreliability of instruments. Such filters should be checked daily until rate of clogging is established. The ash is so fine that carburetor air screens in common use on airplanes may not be expected to be very effective. Such screens should be examined after each flight as ground operations may cause so much dust to be absorbed as to clog up the carburetor screen too much to obtain normal power. We have received information from the Air Force that a chemical analysis of the impurities in the air resulting from the recent volcanic action shows the acid content to be negligible and that earlier fears of possible extensive corrosive action are now relieved."

Operations Re-established

Flight operations were finally re-established with the "tug-and-towbar" technique. It was discovered that the cloud of dust raised by a landing plane could be kept at a minimum and clear of the engines by shutting off the engines on landing and having the aircraft towed in. When the aircraft was reloaded and ready to depart it was towed to the take-off position. Since the dust was so fine it could not be effectively swept, ploughed, or removed in the normal manner, the runup area had been prepared by dumping sand on the ash and wetting it down with sprinkler trucks. The ash readily absorbed water and did not rise under

(Continued on Page 14)

Ordinary runway-cleaning methods were useless. Plowing, sweeping, even an air compressor, were futile against the finely-pulverized volcanic ash. . . .

The Air Force came up with the best solution, powerful jets mounted on a truck. The cross-wind runway and taxiways were cleaned in two days. . . .

Even though the jet's blast raised huge clouds of dust, the clean runways were worth it. But even now, when the wind blows, the ash is back.

Aircraft Approach Tolerances

A Realistic Appraisal of a Very Real Problem, the Demands on Man and Machine in the Payoff Portion of a Flight.

By Arthur E. Jenks.

The problem of aligning and positioning an airplane as a prelude to the safe utilization of the touchdown area of a runway, in weather, might be considered "old hat" by a few people. Some experts take the attitude, "Sure, we know what the problem is—as soon as we have this device or that gadget the problem is solved." It would be natural to assume that with all of our modern know-how and improved radio aids, instrumentation and communications we would, at least, have the approach problem solved.

Even though we cannot make consistent blind landings, the fact is, we *still* miss approaches. We are flying tougher weather in some aspects than heretofore, but, on the other hand, the performance, weight, and procedures have also complicated matters.

There was a time when a second pilot was needed in transport aircraft as a safety factor. Now, the second man has a full-time job, and in our four-engined aircraft we have a third member in the cockpit, the flight engineer. One pilot is flying the airplane, the other is monitoring the instruments, power settings as called for, landing gear and flap configurations, cabin pressurization, and, at the same time, acting as an aerial switchboard operator, handling communications. Due consideration must be given to the demands on both men and machine in this portion of the flight which is the payoff of aerial transportation. If you cannot arrive at the point you started for—safely—the flight cannot be considered a success.

Basic Instruments

Let's take a look at the instruments that we use in modern flying to achieve approach success. Number one, our basic flight instruments which give attitude, heading, and airspeed; Number two, our radio guidance instruments which can be broken down into the following:

(a) A very narrow VHF localizer beam which furnishes runway alignment.

(b) A still narrower UHF glide path beam which furnishes the hill or slope terminating at the end of the runway.

(c) A 75 mc. outer marker beacon along the route which identifies the start of the glide slope at the final approach altitude and a middle marker which is approximately 3500′ from the end of the runway. These markers furnish us with a blinking light indication simultaneously with a tone in the earphones, thereby indicating position fixes as their respective radiation patterns are traversed.

(d) We supplement the 75 mc. markers with low-powered, non-directional facilities at one or both marker locations which give us an ADF bearing at that point, and, in addition, the ADF reversal upon crossing the transmitter is a secondary confirmation of position fixing.

(e) Airport surveillance and precision radar can be used as a primary approach system or both ILS and Radar can be used together, one monitoring the other.

The instrumentation of both ILS and GCA furnish what we call "amount" information. They tell us the amount we are displaced at the precise instant and experienced GCA controllers can usually anticipate the correction and instruct the airplane accordingly. This, however, has its limitations. Likewise on ILS—a given amount of displacement can be corrected very nicely in certain parts of the approach, but in other areas, particularly in close, the same amount of indicated displacement presents a different problem.

In both types of approaches, we are endeavoring to achieve straight-line flight, and any experienced pilot can readily verify that flying a straight line is very difficult—particularly a predetermined straight line and not merely holding a heading. Several types of computers have been built which have increased the overall success of approaches, and the primary function of the computer is to anticipate the correction required and furnish this information either to the pilot in an easy and understandable form so that the desired correction is achieved, or directly to the autopilot.

Straight Line Flight

One of the most important and yet least understood by pilots in general is the flight characteristics of an airplane in straight-line flight. Straight-line flight involves a steady hand and head at the controls and consistently means the employment of minute corrective turns, because to fly a straight path, the plane is constantly varying from one side to another and it is only by instantly and carefully correcting these vagaries as they occur that

About the Author

Arthur E. Jenks was born in Waterloo, Iowa, 1903. Raised and educated in Oregon and California. Began flying career in 1927 as a spare time hobby. Qualified for Transport Pilot license in 1932 and for the next eight years engaged in charter work, student instruction, mapping, etc. Four years of this period were served as Airport Manager and Branch Manager of Pathfinder Air Service at Modesto, California. Joined CAA in 1940 as an Aeronautical Inspector and was based at Roosevelt Field, New York. For sixteen months after Pearl Harbor flew special mission assignment testing radar equipment for U. S. Army Signal Corps. Transferred to Federal Airways as a senior Flight Inspector and in 1945 was made Chief, Flight Inspection Staff, Region I. In 1950, was promoted to Chief, Flight Inspection Division in Washington, which is position now held.

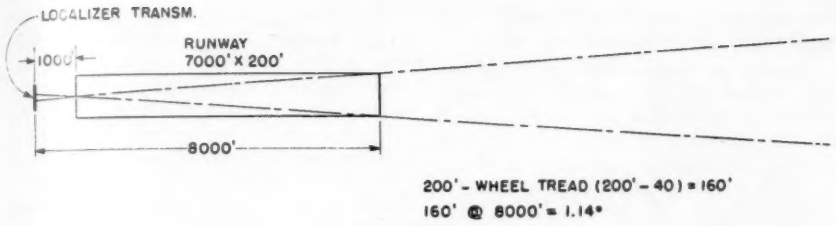


Figure One

straight-line flight can be achieved.

To accomplish this on a visual approach is comparatively easy because in that type of approach you can see where you are going and it is possible to practically "gun-sight" the aircraft if precision alignment is required.

To do this on instruments, with all the "assists" from radio aids means that we have a much more complicated problem. We can no longer "gun-sight" the airplane and our intelligence is restricted to an indication of displacement, or, if we have a computer or a good GCA controller, this anticipatory information will get us back in the groove but—the correction cycle starts all over again if we cannot maintain the groove once it has been achieved.

An examination of the actual physical airspace tolerances that are required will show that our basic problem is a stabilized flight path on a ground track that is within ± ½° of the runway centerline (Fig. 1). The stabilized requirement is only peculiar to precision approaches at low minima. An example of what is possible were the instrument restriction removed is shown in Fig. 2.

Fig. 3 is a sketch of what we are actually trying to accomplish, i.e., straight-line flight within ± ½° of the runway centerline extended, starting beyond the outer marker. An indicated displacement of three needle widths on the deviation indicator is representative of an actual displacement of approximately 500′ from the centerline at a distance of seven miles from the end of the runway, whereas the same amount of indicated displacement means only 184′ of displacement when a mile and one-half out.

Corrective Turns

Now for a brief look at the type of turn a pilot uses for correcting these displacements on an instrument approach. On an average, most pilots use a 1° per second turn which can be interpreted as a bank of 5° to 9°. On most "T" category aircraft, a bank of more than 16° to 18° places the wing tip lower than the landing gear (in the extended position) and pilots are quite conscious of this, particularly in the lower portion of an approach. The majority of corrections are made with the 1° per second turn but the *amount* of turn will vary. A pilot may use a heading bracket of ± 10° at the start of an approach but tries to reduce the bracket to ± 3° as rapidly as possible. This could be considered good practice until we examine all the complexities that affect straight-line flight. Some of the more serious and unpredictable are: Turbulence, gradient windshift, the quality and accuracy of heading information in the cockpit,

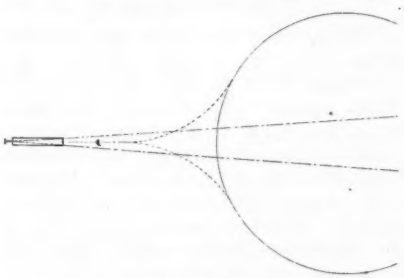


Figure Two

and the quality of the reference alignment, e.g., bends or "scallops" on the ILS beam or GCA asking for a maneuver that the pilot considers too wild at that stage of the approach.

Now to digress a bit. Recently during the CAA-sponsored Approach Light Evaluation Program, wherein pilots were asked to comment on the various light configurations after actual approaches on same, several highly analytical reports were received covering incidents of misalignment in extremely poor visibility on lefthand row configurations. The gist of these reports was that, in the poor visibility, the misalignment was not detected until the threshold of the runway was in view at approximately 1500 to 1700 feet out. The resulting correction of 75 to 100 feet of displacement plus the heading difference consumed the remaining distance on the approach lights and also 1500 to 2000 feet of runway before alignment and attitude were stabilized for landing.

These incidents involved aircraft with landing weight wing loadings of from 45 to 55 lbs. per square foot. After studying these reports the incidents were duplicated in a DC3 and photographed under VFR conditions. The results verified the pilot reports, allowing for the difference in wing loadings.

Lag Due to Instrumentation

Our next contact with this factor of turn correction vs. distance occurred while completing some work on auto approach coupler performance for RTCA Special Committee 18, wherein controlled amounts of ILS beam discrepancy were fed into the coupler and the resulting correction was meticulously followed both from a track and heading study. One of the results of this study was that the aircraft heading started to change within a fraction of a second following the application of the turn but the aircraft track continued on, with no measurable departure therefrom for 1200 to 1900 feet over a ground speed range of from 129 to 171 mph.

A recheck of the instrumentation employed showed that any possible lag due to instrumentation or polarization effect could only account for .8 of a second at the maximum. Therefore, it could be assumed that the aircraft needed from 4½ to 7 seconds (depending upon the initial bank employed) to show a measurable departure from track after the turn had been initiated. All of these turns were made by auto pilot so there was no human factor of dissimilarity to be considered.

Our next reference is a research memorandum published by NACA entitled: *"A Comparison of Effectiveness of Coordinated Turns and Level Sideslips for Correcting Lateral Displacement During Landing Approaches"* by Stanley Faber. The results of this work are summarized in the report as, "For

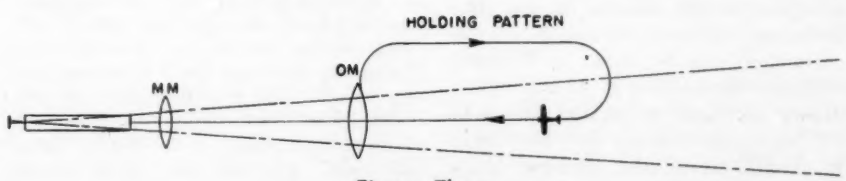


Figure Three

all distances from the end of the runway, coordinated turns are the most effective maneuver. At distances of less than 1300′, the amount of correction is almost negligible for either maneuver." The particular aircraft under study in this report was a C-54D with a wing loading of 36.9 lbs. and the approach speed used in the work was 120 mph. Whereas the conclusions arrived at in this report are partly from flight tests and partly from computation, the distance factor of 1300′ comes very close to the findings in the approach coupler study, if allowance is made for the difference in wing loading.

One Serious Detriment

In resuming the discussion of the type of turn used in a precision approach, it is apparent that one of the more serious detriments to achieving straight-line flight is the fact that the aircraft does not respond to these minute turns or corrections at the instant of application. The aerodynamic forces may be applied for a corrective turn, namely, the coordination of bank, rudder, and elevator. Yet the mass of the aircraft continues along a ballistic path until these forces become of sufficient quantity to deflect the mass in the desired direction.

The time lag in response to small corrections appears to be a function of wing loading and ground speed insofar as distance consumed before the turn becomes quantitative. This difference between the theoretical aerodynamic path of the aircraft and the actual ballistic path of the aircraft may be likened to the same effect that causes slip in the measurement of propeller efficiency. The turning forces are established when the airplane is banked followed with appropriate coordination of rudder and elevator. The time for these forces to react in a slow speed aircraft with a low wing loading is almost negligible, but in high wing loadings and approach speeds in the 150 mph category, it becomes a factor that must be considered if we wish to improve our approach success.

For example, at a mile and one-half from the end of the runway, the pilot still on instruments observes that he is slightly off course, perhaps only two or three needle widths on his ILS deviation indicator. He applies a small correction, usually about a 5° turn. With a wing loading of 45 lbs. to the square foot and a ground speed of 135 mph, the aircraft will just begin to deviate from the previous track after he has turned 5°. The airplane has progressed nearly 1500′ before any measurable departure can be noted.

Insofar as the pilot is concerned, he has turned 5° and nothing has happened so he adds a few degrees more to "pep things up" and it does! In the meantime, the aircraft's track is beginning to coincide with the aerodynamic track. Things begin to happen fast now and the correction overshoots the desired alignment before the pilot can turn in the opposite direction. Until he has turned in the opposite direction some 3° or 4°, his flight path continues to become displaced on the opposite side.

Finally, the second correction takes effect and he has to turn the other way to stop it. All of this is an attempt to show how a flight path oscillation can develop that seriously disturbs the pilot's "tranquillity of spirit." It produces instability and consumes precious time, particularly when the end of the runway is approaching at the rate of 200′ per second.

Transition Stage

With present-day minimums, at some point near the middle marker, the transition from instrument to visual flight occurs. This can be anything from something fairly abrupt to an operation that is quite gradual, lasting from 8 to 12 seconds. The transition stage is from the point where the first light is identified to the point where the flight is entirely visual and can be continued to touchdown in that manner.

Now if we can pause a moment and summarize the situation at this point, it would be of this order: The pilot has done a routine precision letdown for the first three miles of his approach and has descended from 700 to 900 feet from his starting altitude. It is becoming increasingly difficult to maintain straight-line flight due to the slight oscillatory condition that has developed and while devoting his attention to dampening the oscillation, and at the same time staying within alignment, lights become visible. He still cannot leave instruments until the lights are identified and sufficient quantity (depending upon slant range visibility) are in view to continue the flight visually.

If, at this point, on the approach he is passing through the critical altitude of his aircraft, the decision must be made then and there to either land or abort. This is a tremendously psychological responsibility on the pilot. The responsibility is his for a "snap decision" affecting the safety of his passengers and equipment. You cannot place a monetary value on this type decision. The pilot has no chance to mull it over or "table" it until tomorrow; in fact, he cannot choose his own time—approach control and the speed of his aircraft do that for him. Pilots such as our airline captains are trained to stay ahead of every situation, to think well in advance of every probability, yet this is one instance where they have to take it as it comes and only experience, proficiency, and "recency" are the things that count. We can ease this part of the pilot's problem if we can guarantee alignment, keep him "in the groove" and let him devote all of his attention to "go" or "no go" straight ahead, without superimposing the problem of "which side am I going to be on?", "can I bend it around and get in?", "am I off too far to make it?" and "if I do make it will I have enough runway left to stop on?"

Conclusions

1. A factual measurement of the turn/time lag should be made for each type of "T" category aircraft at the time of certification and the results placed in the operations manual. The measurement should be made at gross landing weight and blanket the bank angles and approach speeds allowable.

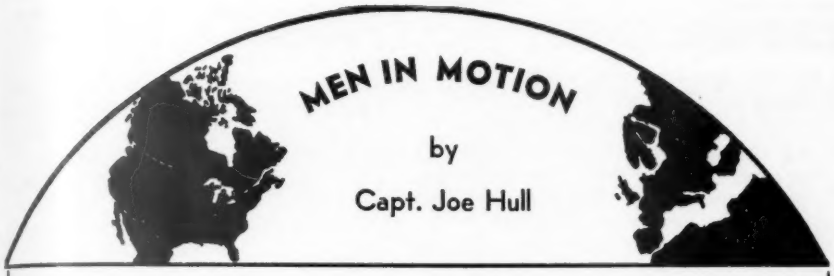
2. Precision approach paths, particularly the last three miles or final stabilizing zone must be as straight as possible.

3. Heading instrumentation in the cockpit should be improved. Lag or load in a gyro repeater can seriously add to oscillation problems.

4. Approach light lanes are not long enough. The light lane should be as long as the duration of the greatest allowable correction for the heaviest and fastest aircraft; otherwise, the runway must be used for this purpose. The cost and availability of landing surface is critical so it should be used for its intended purpose and not to fly over, straightening out alignment problems.

5. With the advent of DME or other suitable means of knowing position while on an approach, an appreciable improvement in pilot technique is in order, after procedural training.

6. GCA controllers should be acquainted with the turn time lag and allow for same in GCA procedures. At present, there appears to be a blanket policy of allowing seven seconds for aircraft response. GCA personnel charge this to communications lag and pilot reaction time, when actually it is the aircraft itself that has the slow response.



OBITUARY OF THE FLYING SAUCERS

When historians compile their chronicles of the 20th century they will record an age of scientific progress unparalleled in the annals of mankind. Of the 2000 years since Christ, none will rate so much attention as that 100 years which brought the world the auto, the airplane, radio and television, wonder drugs, and atomic energy, with either its concomitant wars of dreadful devastation or a jittery world at "peace," poised precariously on the brink of self-destruction.

But if the scribes are faithful in their chores they will record six of the most utterly fantastic years—an incredible period for such a modern age—that fell during the exact middle of the century, during which a series of events transpired that will appear so unbelievable as to tax the credulity of the men commissioned to write of them. Little wonder if they hesitate to set down the account of this ludicrous period in world history when men of all nations—but notably America— were agog with excitement over an apparition as nonsensical as the witches of Salem in the 17th century.

The historians will mark 1947 as the year the "flying saucers" came, an event with such exciting implications that the imagination of the whole world was fired to fever pitch and intelligent human beings found themselves reduced almost to the emotional level of their superstitious colonial or aboriginal forefathers, so intense was their devotion to this provoking and popular puzzle. During the hectic heyday of the saucer's mystical reign people discussed no other subject more, and on many occasions legitimate news was relegated to the second page of the daily journals. Nothing took precedence over the mysterious disks, which in spite of countless sightings by authoritative observers, successfully resisted all efforts at capture, either in body or upon photographic film.

The histories which our progeny will study should mark the year of 1953 as the end of the flying saucers. For it was in this year that the riddle which had plagued the world for seven breathless years was exposed for all to see by a man who steadfastly refused to allow fear, credulity, and superstition to overcome reason. His revelations restored some semblance of sanity to a society which had retrogressed shamefully backward along the path to the Dark Ages. America's gullibility has been an especial disgrace.

Dr. Donald H. Menzel is an eminent astronomer and scientist from Harvard University. His thousands of hours of searching the heavens by eye and by telescope, as well as his wealth of experience in the air, on the sea, and under the sea, provide him with ample qualifications to discuss the subject of flying saucers from the professional point as well as through the eyes of the layman. His new book, *Flying Saucers,* is an out-and-out masterpiece and it belongs in the library of every airline pilot, whether he has believed in the existence of these awe inspiring phenomena or not. Of all the books written on the subject, this is the first dealing in common sense.

It is right here I wish to confess that from the very first sighting of a saucer by Kenneth Arnold over Mt. Rainier in 1947 (not really the first according to Dr. Menzel) I have believed implicitly in the existence of these nebulous will-o-the-wisps, passionately defending my views against all the "heretical" attacks made upon them. The seemingly authoritative sightings by quite a few colleagues (dozens of airline pilots have reported strange objects in the sky) only added more strength to a preponderance

(Continued in Adjoining Column)

of evidence already present that here indeed the world was seeing something new. I did tireless research on the subject for six years, interviewing other pilots, control tower operators, hundreds of passengers, as well as laymen from all walks of life. I devoured voraciously every printed word on the subject, newspaper and magazine articles by the score, and I bought each new book as fast as it hit the market. These ran the gamut from Frank Scully's *Behind the Flying Saucers* (which was immediately branded as a hoax by thinking persons, *True* magazine verifying this last September) to Gerald Heard's highly speculative *Is Another World Watching?* Mr. Heard postulates to the point where he has huge honey bees from Mars building the saucers (like earthly bees build honeycomb) and flying them at the space ship speeds attributed to them. Donald Keyhoe, aviation editor of *True,* was the first to speculate on the interplanetary origin of the disks, a postulation that found ever increasing support, until today it is the theory held most plausible by saucer devotees.

Dr. Menzel, once and for all, explodes all the silly notions I have shared with millions of other people. But paradoxically, he does not deny the existence of the saucers or the sightings. *He readily admits the saucers are real* but he proves they are not what the sighter thinks they are. He explains away scientifically each type all the way from the great saucer of 1882 down through Arnold's 1947 saucers. Captain Mantell's Kentucky saucer, the New Mexico fireballs, the unknown lights of Japan are dealt with in painstaking detail. He saves until last the enigma of the Washington D. C. radar saucers which bid fair to put the Republican Convention off the front pages last year when the story broke. This chapter should prove wonderful reading to those who believe implicitly in the infallibility of radar images.

Only in recent weeks the CAA has images. Only in recent weeks the CAA has accepted his refraction explanation for the "Martian" blips which had the radar operators nonplussed and aghast on more than one occasion. The have proved his theory is the correct answer.

Dr. Menzel's presentation is dispassionate and methodical, his logic brilliant. His book reflects e n o r m o u s research.

He proves by accepted standards that *not one genuine, solid, material saucer* has ever been photographed or proven by other means. Most of the

(Continued on Next Page)

MEET YOUR VICE-PRESIDENTS

The requisites necessary to serve in the vital capacity of an ALPA vice-president are possessed in abundance by Capt. L. R. Williams, AA, Regional Vice-President for Region IV.

Prior to his election as Regional Vice-President, he had already given generously and faithfully of his time and talents to ALPA affairs. The many elective offices he has held have given him a broad understanding of ALPA and amply demonstrated the time-tested confidence his fellow pilots have placed in him.

His Association activities have included serving as copilot representative, Council Chairman (Memphis, 1942), Vice-Chairman (Ft. Worth) and a member of the System Board of Adjustment.

Born in Ovalo, Texas, August 11, 1907, Capt. Williams attended high school in his home town. He graduated from McMurray College, Abilene, Texas, in 1931 with a degree in business administration. He taught school until receiving an appointment to Randolph Field in March, 1932. Two years of active duty at Barksdale Field, La. followed his graduation from Kelly Field in Feb., 1933.

His air line career began with UAL in the summer of 1936. He transferred to American in August of the same year, was promoted to Captain in 1940. He has been based at Chicago, New York, Memphis, and Ft. Worth.

Captain Williams is married and has two boys, ages 18 and 14. Both, he says, have the flying yen. The oldest has soloed and is presently working on his first ticket.

Operation Volcano . . .

(Continued from Page 9)

the engines when lower-than-normal runup power was used. Thus, the boiling cloud of dust raised by the plane remained behind the engines and windshield allowing a normal takeoff in this respect. However, additional maintenance checks on the aircraft at other bases were set up as a precautionary measure.

Ground equipment continuously exposed to the ash was certain to be effected. Ground crew men were covered from head to foot. Any movement through it would send the dust swirling upward eight or ten feet. Because of this, the carburetors, air filters, distributors, generators and other accessories requiring such maintenace removed from all ground equipment and cleaned twice daily.

Cleaning Runways

Once a fairly regular operation was again established, the airport maintenance department faced the vital problem of cleaning the runways. Sanding and sprinkling the ash and then plowing with a grader proved only partially effective. However, it was exceedingly slow work and left considerable residue. Washing the runways was too big a problem requiring far too much pressure to move the heavy water-soaked ash.

The Air Force came up with the best solution, one which removed all the ash and moved along at a satisfactory rate. The Army had previously used two F-80 fuselages with jet engines mounted on a railway car for removing ice and snow from the rails and switches of their branch line off the Alaska Railroad into Elmendorf Air Force base. These were mounted on trucks and by working on the cross-wind runways and taxiways the ash was successfully blown from them in a matter of two days. The jet's blast raised a huge cloud of dust in the area, but results were worth it. They later moved their equipment over to Anchorage International Airport and repeated the job there.

The effects of the ash will be felt for some time. Whenever a strong wind blows, the ash is once again in motion and is blown from the surrounding mountain area cutting down the visibility and coating the runways. There is a tendency to cake when wet and, as a result, it is felt that a heavy rainfull will be helpful. There will, undoubtedly, be some increased maintenance despite all precautions. Being composed of exploded glass, the ash is so abrasive as to leave scratches when swept from an automobile fender with a broom. But we have learned how to solve an exceedingly unique problem.

Men In Motion . . .

(Continued from Page 13)

photographs of purported saucers have been absurdities. One of the best examples of this was the photo made by a Coast Guardsman in Massachusetts of three lenticular cumulus clouds, a type seen often by airline pilots. This photo fooled nobody but the gullible and sensation seeking saucer sectists, who comprise that curious minority who really want to believe in the occult. The humorous but factual discovery that a whitewashed stone in the parking lot in the foreground of the picture more nearly approximated the dimensions of what a flying saucer is supposed to look like than any of the three clouds did little to quell the foolish enthusiasm of the credulous followers of the disks. These fantasists really die hard.

Dr. Menzel has rendered a great service to his country and to the world. He has disproven hundreds of supposedly real flying disks by the simple expedient of thought process, consigning them forever to the limbo they deserve, along with witchcraft and sorcery. I am grateful to him for deliverance. From now on, my camera, which has been my constant cockpit companion for years, stays in the flight kit.

AIR LINE PILOTS ASSOCIATION MUTUAL AID ASSOCIATION

BALANCE SHEET
July 31, 1953
Assets

Cash	$29,375.00
Total Assets	$29,375.00
Liabilities	
Members' Deposits	$29,375.00
Total Liabilities	$29,375.00

STATISTICAL INFORMATION
July 31, 1953

Number of Members	613

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Safety Conferences Hit High Attendance Marks

By Capt. R. J. Wisda

Pilots, wives, flight engineers, supervisors, CAA and air line representatives, airport fire-fighters, and aircraft builders . . . they all turned out, some 800 strong, for ALPA's largest Local Air Safety Conference at Los Angeles on July 22 and 24.

Capt. W. S. Cole, WAL, as Chairman of the conference, M.C.'d the program of notable speakers and guests both evenings.

Captain Larry Shapiro, UAL Council 57, gave his views, gathered from extensive research, on cockpit procedure projects.

Joseph S. Merriott, Regional Administrator, 4th Region, CAA, explained the safety economy possible to achieve through proper coordination of pilots with the CAA.

B. M. Jacobs, Chief of Aviation Safety Division, CAA, told of safety measure projects already done and to be completed by the CAA for the pilots use.

Captain Carl Peternell, UAL Council 57, and ALPA Fifth Regional Vice-President, explained some of the aspects of the new regional set-up.

Guest of honor the first night was Col. Frank K. Everest, Jr., USAF Chief of Flight Test Operations Laboratory, who spoke on the highlights of testing jet and rocket equipment in addition to showing movies on the X-1.

On the second night Major Charles Yeager, USAF, Asst. Chief Flight Test Laboratory, described his exploits beyond the realm of sound in the X-1.

The NACA Crash Fire Research Project Films were also shown.

To top the meetings off was a short address by colorful Benny Howard. He gave some of his views on aviation safety and the ways which he thinks that safety can be incorporated in airplanes flying today.

An unexpected by-product of the meeting was the enlightenment of the large number of ladies present on pilots' working conditions and the effect that their homelife has on mental attitude in the cockpit.

Much credit for the meeting's success is due to the various pilots who donated their services in organizing the meeting, and to Western Air Lines who furnished the hall, janitor service and refreshments at cost.

The Cover Picture: Jet Talk

The men on the cover are looking toward the future, the not-too distant future of turbo-jet commercial aircraft. The picture was taken at the joint ALPA-CAA meeting on August 11 and 12 at which the many aspects of design and operating criteria for turbine-powered aircraft were discussed.

Men in the photo are:

Front row (l. to r.): Ted Linnert; A. W. Stainback, UAL; D. L. Phillips, TWA; Carl Eck.

Center row (l. to r.): R. J. Auburn, CAA; Robert F. Gates, CAA; Robert V. Ford, CAA; C. N. Sayen; Harold Hoekstra (acting Chairman for George W. Haldeman); Burdell L. Springer, CAA.

Rear row (l. to r.): H. G. Portman, Jr., UAL; Charles H. Ruby, NAL; V. H. Brown, AA; R. A. Stone, UAL; V. A. Peterson, UAL; W. W. Moss, PAA; Jack A. Durham, AA; and Jack C. Burn, PAA.

A complete summary of the two-day meeting will appear in an early edition of the AIR LINE PILOT.

Air Line Pilots Association Federal Credit Union Financial and Statistical Report July 31, 1953

BALANCE SHEET

Assets

	July, 1953
Loans (634)	$381,211.43
Cash	201,949.48
U. S. Bonds	345,528.92
Furniture & Fixtures	2,567.24
Prepaid Expense & Misc.	27.50
Total	$931,284.57

Liabilities

Shares	$901,148.89
Reserve for Bad Loans	13,093.58
Undivided Profits	2,681.04
Profit	14,090.60
Accounts Payable	270.46
Total	$931,284.57

STATEMENT OF INCOME & EXPENSE

Income

	July, 1953
Interest on Loans	$3,753.54
Investment Income	
Total	$3,753.54

Expenses

Salaries	$1,441.56
Office Expense	33.73
Educational Exp.	
Loan Insurance	280.40
Depreciation	62.72
Misc.	
Total	$1,818.41
Net Profit	$1,935.13

Statistical Information

	July, 1953
Number of Members	2,367
Number of Potential Members	10,865
Loans Made Since Organization (Number)	2,428
Loans Made Since Organization (Amount)	$1,695,296.37

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